

Application No. 10/727,286  
Amendment dated September 22, 2006  
Reply to Office Action of April 6, 2006

## **REMARKS/ARGUMENTS**

Claims 1-20 are pending in the application. Claims 1-17 stand rejected. Claims 18-20 are withdrawn. The Applicants have amended claims 1, 11, 13 and 14, the specification, and FIG. 1 as shown above. Support for the amendments can be found in the specification as filed. No new matter has been added by way of these amendments. Based upon the above amendments and the arguments below, the Applicants submit that claims 1-17 are now in allowable form. Reconsideration and allowance are respectfully requested.

## **DRAWINGS**

In the Office Action on page 3, the Examiner has objected to the drawings under 37 CFR §1.83(a) for not showing the reference numeral “d1”. A replacement sheet for FIG. 1 is concurrently provided herewith showing the reference numeral “d1”. The Examiner has also requested a definition for the term “cord thickness”. Applicants submit however, that one of ordinary skill in the art would understand the definition of cord thickness in relation to an O-ring (particularly in light of amended FIG. 1). The Applicants submit the specification is clear as written, and therefore request the objections be withdrawn.

## **SPECIFICATION**

In the Office Action on page 4, the Examiner has objected to the specification for not describing “b1” as it relates to the invention. The Applicants have amended page 12 as above to define “b1” as the width of the groove. Referring to FIG. 1, it is clear that “b1” refers to the width of the groove. Accordingly, the Applicants request the objection be withdrawn.

## **CLAIM REJECTIONS UNDER 35 U.S.C. §112**

In the Office Action on page 4, the Examiner has rejected claims 11, 13, and 14 for reciting “means” elements, yet not invoking 35 U.S.C. §112, ¶6. The above

amendments to the claims eliminate the “means” language and do not represent any narrowing of the scope of the claims. Thus, the Applicants request the rejection of claims 11, 13, and 14 be withdrawn.

### **CLAIM REJECTIONS UNDER 35 U.S.C. §103**

In the Office Action on page 4, the Examiner has rejected claims 1-4, 8-10 and 16 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,813,932 (hereinafter “Hobbs”) in view of U.S. Patent No. 6,409,175 (hereinafter “Evans”). The Applicants respectfully traverse the rejection. Independent claim 1 recites, inter alia:

the guide tube is formed an O-ring seal held by a groove which seals off the piston, has a gas permeation coefficient of 100 to 500 N\*cm<sup>3</sup>\*mm/(m<sup>2</sup>\*h\*bar) for nitrogen (N<sub>2</sub>) and a radial compression of less than 30% and the seal fills the groove with a groove filling level of more than 90%.

(Emphasis added.)

The Examiner concedes that Hobbs does not expressly disclose that the radial compression of the seal is less than 30% or that the seal fills the groove at a level of more than 90%. The Examiner cites Evans for teaching O-ring seals that are compressed at either 10% or 20% (less than 30%) will fill the groove at a level of more than 90%. The Applicants respectfully disagree.

A complete review of Evans reveals that the O-ring within the seal assembly does not have the structure, or function in the same manner, as the O-ring claimed by the Applicants. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *See, W.L. Gore and Assoc. v. Garlock Inc.*, 721 F.2d 1540 (Fed. Cir. 1983); MPEP §2141.02. Evans discloses a method and apparatus for obtaining a secure mechanical connection and a pressure-tight seal in the overlapping area of two telescoping tubular bodies. The seal in the connection comprises an annular elastomeric seal ring and annular Teflon spacer ring carried in a specially dimensioned groove. (Evans, Abstract.) FIG. 19 of Evans is a table

illustrating the relationship between the percent expansion of the pipe body and characteristics or dimensions of the seal ring (O-ring), groove width and spacer ring (position ring). At column 12, lines 20-37, Evans states that “[t]he position ring should occupy more than 49.5% of the volume of the groove. The O-ring should occupy less than 41% of the volume of the groove. With this combination of seal ring and position ring, less than 9.5% of the groove volume is not filled.” (Emphasis added.) This clearly establishes that the O-ring disclosed in Evans neither exhibits radial compression of less than 30% nor occupies more than 90% of the groove. Notably, Evans teaches exactly the opposite, i.e., that the O-ring fills less than 41% of the groove.

First, the table in FIG. 19 of Evans does not reference an O-ring radial compression of less than 30%. Rather, the table shows the relationship between pipe body expansion as a percentage and the dimensions of the components of the seal assembly.

Second, the O-ring disclosed by Evans cannot fill more than 90% of the groove without the presence of the spacer (position) ring. At column 10, lines 8-11, Evans states that “FIG. 8A illustrates details in the seal assembly 35. As may be noted by reference jointly to FIGS. 7A and 8A, the seal assemblies 28 and 35 do not completely fill the grooves 31 and 35a within which they are positioned.” Referring to FIGS. 10 and 10A of Evans, “[b]efore the connector is expanded, the seal ring 31 and spacer ring 40 are seen to occupy less than all of the volume defined by the annular groove 39 and the pin nose.” (Evans, col. 10, lines 48-51.) This clearly demonstrates that the seal assembly in Evans only fills the groove after expansion of the connector, and only does so with the presence of the spacer ring. The clear necessity of the spacer ring to complement the less than 41% groove fill of the O-ring in Evans teaches away from the O-ring filling more than 90% of the groove as claimed by the Applicants. Indeed, the Applicants claim an O-ring seal with a radial compression of less than 30% and a groove filling level of more than 90%. Accordingly, the deficiency of Hobbs is not remedied by Evans.

In summary, the combined teachings of Hobbs and Evans do not result in the invention of claim 1. The Applicants submit Evans teaches away from an O-ring seal

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with a “radial compression of less than 30% and a groove filling level of more than 90%.” The combined teachings of Hobbs and Evans (assuming arguendo that such combination is proper) would result in an O-ring seal with a groove filling level of less than 41%. This is very different from the presently claimed invention.

The Applicants respectfully submit the subject claims are not obvious in view of the cited references. Claims 2-17 depend, directly or indirectly, from claim 1 and recite additional features therefor. Thus, these dependent claims are also allowable. Accordingly, the Applicants respectfully request this rejection be withdrawn.

### **CONCLUSION**

Applicants submit that all claims pending in the patent application are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

Respectfully submitted,

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